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ABSTRACT

The System for Program Information in Continuing Education (SPICE), an information system being implemented at The University of Calgary (Alberta, Canada), was designed to facilitate the collection, manipulation, and reporting of evaluative data from continuing education program participants. The objectives of the system include the following: to improve the quality of evaluative information collected through participant questionnaires; to provide a set of descriptive data elements which will be common to all continuing education offerings; and to retain information in a format and medium which will facilitate long-term comparative research and evaluation studies. There are four components to the system: a file of evaluation test items for questionnaire preparation; participant responses and other program data; data base of questionnaire and course information; and a capacity for generating three types of analytical reports. Diagrams of two subsystems, technical specifications, and a ten-step procedure for using SPICE are appended. (EM)

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THE DEVELOPMENT OF AN AUTOMATED DATA BASE FOR PROGRAM RESEARCH AND EVALUATION IN CONTINUING EDUCATION

presented to

THE ADULT EDUCATION RESEARCH CONFERENCE

San Antonio, Texas

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I Introduction

A. Purpose of the Paper

This paper is intended to present a description of an information system currently being implemented at The University of Calgary. The purpose is two fold: to assist others in the development of such systems for their own use and to solicit suggestions as to how this particular system might be improved, on the basis of other experiences.

The system, known as "System for Program Information in Continuing Education" or "SPICE" has gone through the design, programming, and testing stages and is presently being implemented on a limited basis within the Faculty of Continuing Education. It is anticipated that the system will be fully implemented before the Fall of 1978.

B. Organizational Environment

The University of Calgary is a publicly supported university with some 11,000 full-time students in a wide range of professional and non-professional faculties. It is located in the City of Calgary which has a population of just under 500,000.

The Faculty of Continuing Education provides a cross section of offerings with a heavy emphasis on continuing professional education. In the past year there were approximately 16,000 registrations in part-time non-degree programs. These programs contained some 700 different offerings (courses, seminars, workshops, conferences). The faculty consists of seventeen academic staff and thirty-five support staff. Faculty members in Continuing Education collaborate with faculty from the other academic units on campus in the organization, delivery, and

evaluation of non-degree programs throughout the year and degree programs in the special spring and summer sessions. The University has assigned the responsibility for co-ordinating all continuing education activities to The Faculty of Continuing Education.

Continuing Education receives technical systems support from the Department of Administrative Systems. This support includes assistance in systems design and development as well as full operational services such as keying, software maintenance, and running of computer programs through the university's computer services.

C. The Design Rationale

Although differences exist between research and program evaluation many similarities, particularly in methodology or process, are obvious. While the goals and objectives of the research and evaluation activities will differ they may collect similar data and apply similar statistical procedures. It is because of this similarity in process that the System for Program Information in Continuing Education is seen as a resource for both program evaluation and research. In addition, it is recognized that certain management processes such as resource allocation and control can make use of much of the same information. SPICE can therefore serve as an independent system providing data and analytical and reporting capabilities to several concurrent and often interdependent activities.

For a system to effectively serve several masters it must be designed with a high degree of flexibility. This was a major consideration when determining the type of data to be collected and the reporting capabilities of the system.

However, too much emphasis on flexibility would detract from the capability of the system to integrate the many activities using the

information resource. This integration seems particularly important among the many separate evaluation studies and between these studies and the managerial decisions relating to program priorities and resource allocation. An attempt has been made to reach a reasonable compromise between flexibility and integration by incorporating a common subset of data elements for all continuing education programs while still allowing for a large segment of variable evaluative data and a range of analysis and reporting possibilities. This point is elaborated under the description of system components.

The system was designed to facilitate the collection, manipulation, and reporting of evaluative data from one primary source: the program participants. While it is recognized that data from many sources such as instructors, program directors, and outside experts may be desirable and at times essential, it was decided to focus on participant responses to post-seminar questionnaires as the primary source of evaluative data. Within the context of our organization it was determined that participant perceptions were the most commonly used quanitative data and that while a great deal of effort was being expanded in collecting and analyzing the information no long-term nor broadly based studies were possible since the data were not retained in useable form.

II Objectives of the System

A. To improve the quality of evaluative information collected through participant questionnaires. Wherever possible data collected on one questionnaire should be comparable with that collected on another.

B. To provide a set of descriptive data elements which will be common to all continuing education offerings, whether or not a participant questionnaire was administered.

C. To retain information in a format and on a medium which will facilitate long-term and comparative research and evaluation studies in addition to the routine evaluation of a single program.

D. To provide analytical and reporting capabilities which will provide maximum flexibility in the aggregation and reduction of both evaluative and descriptive data.

E. To achieve maximum efficiency in the operation of the system through the adoption of appropriate data processing technology and procedures.

F. To provide simplicity in the operation of the system. A variety of users such as program directors, instructors, and community planning committees should be able to interpret reports with little or no assistance.

III Components of the System

A. Questionnaire Preparation

A permanent, computerized file is maintained of all test items used on questionnaires administered to students. When a questionnaire is being designed for a program (course, seminar, etc.) a set of questions is selected from the file by the program organizer. If requested, the system will print out the questionnaire or it may be typed from the master list of questions.

A form is filled out indicating which questions will be asked for

this particular course and in which sequence they will appear on the questionnaire. This information is input to the system to be used during the analysis stage.

The question file also contains "short forms" of the questions which are used in the reporting programs. In addition, each question is identified in the file by a four digit number and classified according to the particular area being evaluated e.g. teaching methodology, content, administration.

Two question formats are possible: multiple choice questions with up to nine possible answers permitted, and, questions which require the respondent to rate a statement on a scale of from one-to-five. While open-ended questions are frequently asked there is no attempt to collect the responses in the system.

B. Data Collection Procedures

Participant responses to questionnaires are keyed directly from the questionnaires and input to the system through batch updates.

Other program data is collected on a form called the "Prep Sheet". This form is used in the basic program planning process and a copy of it is submitted for keying and then updated through the batch system. Other data such as enrollment figures are submitted on a separate form after the course/seminar is complete.

C. Data Base (computerized files)

The data base consists of two physically separate magnetic tape files; the Question Master File (referred to above) and the Course Master File. The Question Master contains all test items available for questionnaires, along with a question identifier and a "short form" of the question. Questions are added to this file as required through the update procedure.

The Course Master uses a course number as the access key and contains

1. the identifying numbers of all questions asked in the evaluation of that course,
2. the responses to the questions for each participant, and
3. a set of data elements describing the course.

For every course/seminar offered by the Faculty the descriptive data is collected and stored, whereas not every course/seminar is evaluated through the use of a questionnaire.

The descriptive data retained for each course/seminar are listed below.

1. Course number - 6 digits, incorporating the year in which it is offered.
2. Previous course number - allows for one to "link" back for comparative analysis.
3. Start date
4. End date
5. Course type - 2 digits reflecting the nature of the content or participants.
6. Cancellation indicator
7. Instructor
8. Estimated enrollment
9. Actual enrollment
10. Fee
11. Person-in-charge
12. Hours of instruction
13. Type of instruction - lecture, workshop, newspaper course, etc.
14. Projected revenue

15. Honoraria - instructors' fees

16. Other expenses

D. Analysis and Reporting Programs

There are three main types of reports available within the system

1. Analysis of Questionnaire Responses. A simple frequency distribution is printed showing the distribution of all responses to all questions, in absolute and percentage terms. The program also calculates the mean and indicates the number of responses to each question.

   If requested, cross tabulations will be computed for any combination of responses, within the same questionnaire. In instances where the same questionnaire was used in more than one course/seminar the responses may be aggregated and treated as one population. This is particularly useful for doing longitudinal studies of a program which has been repeated several times, comparing several sections of the same course/seminar, or comparing several offerings by the same instructor.

2. Reports from the Question Master File. Programs are available to report either a master listing of questions currently on the file or a list of selected questions which will be used in a particular questionnaire.

3. Course Information Reports. Since data are collected for all courses/seminars, whether or not they are evaluated through student questionnaires, the system is useful for reporting continuing education activities over a given time period. Reports may be sorted by start date, course type,

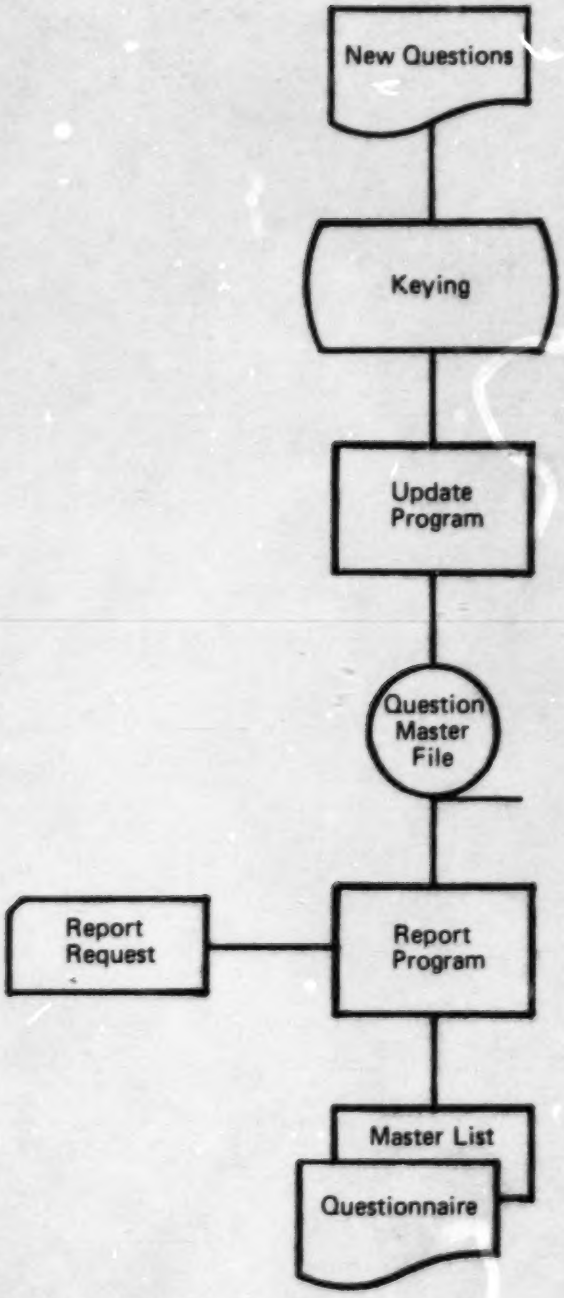
or by person-in-charge.

IV Additional Future Uses of the System

Computer programs are presently being designed to make use of the course data for management purposes. Reports will be generated to meet many of the requirements of Statistics Canada, the provincial government, and other university offices. By using the budget figures on the file, estimates will be made of revenue over a given planning period, and by a combination of other data elements will provide analysis of the distribution of resources across the programming areas.

It is anticipated that SPICE will eventually interface with an automated student registration system which will include a comprehensive file of student records. Use of such a student file together with the course and respondent data from SPICE will provide tremendous opportunities for expanded research and evaluation of our Continuing Education programs.

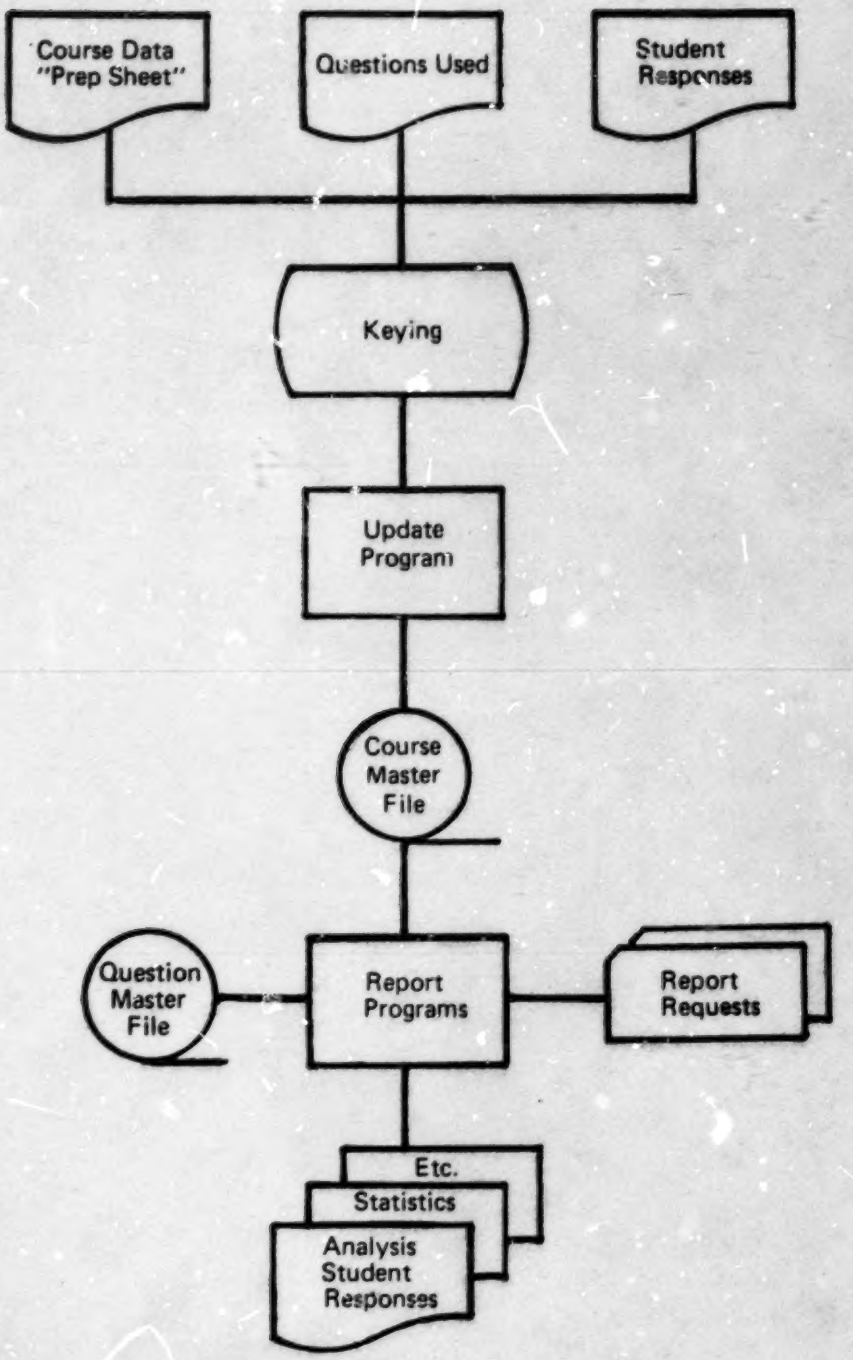
SYSTEM for PROGRAM INFORMATION in CONTINUING EDUCATION (SPICE)



QUESTIONNAIRE SUBSYSTEM

APPENDIX II

SYSTEM for PROGRAM INFORMATION in CONTINUING EDUCATION (SPICE)



DATA ANALYSIS SUBSYSTEM

APPENDIX III

Technical Specifications

Computer System - IBM 370-148-VS

Programming Language - COBOL (VS)

Data Collection System - Video 370

- 80 character update record

Files - 2 sequential (magnetic tape) files

- 125 character course records

- 200 character question records

APPENDIX IV

SPICE

Generalized Procedure

Continuing Education	1. Completes "prep sheet" with course information
Administration Systems	2. Keys course data, updates course file
Continuing Education	3. Selects questions for questionnaire
	4. Has system print questionnaire or has it typed
	5. Completes form listing questions used
Administration Systems	6. Keys list of questions and updates to course file
Students	7. Complete questionnaire
Administration Systems	8. Keys answers, updates to course file
Continuing Education	9. Requests analysis, specifying courses to be included and number of cross tabulations
	10. Collects enrollment data, forwards on form
Administration Systems	11. Keys in request and new data
	12. Runs reports, delivers to Continuing Education